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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,959	03/29/2006	Shigeki Satou	890050.538USPC	1743

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SEED INTELLECTUAL PROPERTY LAW GROUP PLLC
701 FIFTH AVE
SUITE 5400
SEATTLE, WA 98104

EXAMINER	
NGUYEN, KHANH TUAN	

ART UNIT	PAPER NUMBER
1796	

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11/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,959	SATOU ET AL.	
	Examiner	Art Unit	
	Khanh T. Nguyen	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 09/17/2007 is entered and acknowledged by the Examiner. Claims 1-9 and 11-16 are currently pending in the instant application. Claim 10 have been canceled.

The rejection of claims 1, 4, 8, 9 and 13-14 under 35 U.S.C 102(e) by Takayuki et al. is withdrawn in light of Applicant's remarks.

The rejection of claims 2, 10-12, and 15-16 under U.S.C 103(a) over Takayuki in view of Oda et al. is withdrawn in light of Applicant's remarks.

The rejection of claims 2, 3, 6, and 7 under 35 U.S.C 103(a) over Takayuki in view of Nishide et al. is withdrawn in light of Applicant's remarks.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 03/29/2006 has been regarded by Examiner and made of record in the application file.

Claim Rejections - 35 USC § 112

4. Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 comprises steps of adding 0.25-1.7 weight parts of binder (0.2-1.5% weight) and 3.0-15.0 weight parts of solvent (2.6-12.9% weight) to 100 weight parts of conductive powder (85.7% weight) and kneading until the solids concentration of the mixture reaches 84-94%. The Examiner is unclear how the upper limit of 94% of solid concentration can be obtained by kneading when a maximum of 1.5% weight of binder and 85.7% weight of conductive powder are kneaded in a 12.8% weight of solvent. The maximum solid concentration (binder and conductive powder) is about 87%.

Claim 6 comprises steps of adding 0.5-1.0 weight parts of binder (0.45-0.9% weight) and 2.0-10 weight parts of solvent (1.8-9.0% weight) to 100 weight parts of conductive powder (90% weight) and kneading until the solids concentration of the mixture reaches 85-92%. The Examiner is unclear how the upper limit of 92% of solid concentration can be obtained by kneading when a maximum of 0.9% weight of binder and 90% weight of conductive powder are kneaded in a 9.0% weight of solvent. The maximum solid concentration (binder and conductive powder) is 90.9% (about 91%).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3, 4, 7, 12-14, are rejected under 35 U.S.C. 102(b) as being anticipated by Hashimoto et al. (U.S Pat. 6,372,185 hereinafter, "Hashimoto").

With respect to claims 1, 4, 7, 13, and 14, Hashimoto teaches a method for preparing an Ag-Pd conductive paste for ceramic thick film printed circuit board. Hashimoto teaches the conductive paste are manufactured by kneading a mixture of 60-80% weight of conductive powder (Ag), 5-20% weight Pd resinate (Pd content in the resinate being 5-15%) and 2-6% weight of inorganic binder with an organic vehicle made by dissolving 1-5% weight of ethyl cellulose (binder) in 10-20% weight of organic solvent to form a paste (i.e. clay-like mixture) (Col. 1, lines 33-38 and Col. 4, lines 20-34). Additional organic binder such as 0.5-2% weight of polyvinyl butyral may be added to the paste in order to reduce shrinkage during sintering (Col. 7, lines 21-24 and lines 37-39). Hashimoto teaches the organic solvent can be a mixture of organic solvent such as alpha-terpineol, dibutylphthalate, butyl carbitol acetate, and alkyl benzene is used (Col. 4, lines 34-38). The foregoing material (i.e. conductive paste) is mixed and kneaded by an automatic mortar (i.e. kneader) or a three roller mill (Col. 4, lines 38-39). The paste is filtered with a 400 mesh stainless screen. Organic solvents are added to the filtered paste to adjust its viscosity (Col. 4, lines 39-41; Examples 1 and 4). The

disclosure of organic solvent added to the kneaded (filtered) paste mixture is considered to read on the claimed limitations of "a slurry step of adding the same solvent as used at the kneading step to the mixture obtained by the kneading step of lower the viscosity of the mixture, thereby slurrying the mixture".

The reference specifically or inherently meets each of the claimed limitations. The reference is anticipatory.

Regarding claim 3, Hashimoto disclosure inherently teaches a method of manufacturing a conductive paste having a solid concentration within the claimed range. a maximum content of 80% weight of Ag powder and a maximum of 20% weight of Pd resinate (Pd content in the resinate being 15%) to yield a total of 83% weight of conductive particle (Ag-Pd). Hashimoto also teaches a maximum of 6% weight of inorganic binder and a maximum of 5% weight of organic binder kneaded in organic solvent (Examples 1 and 4). Hashimoto

Regarding claim 12, Hashimoto teaches the conductive material are mixed and kneaded by automatic mortar or a three roll mill (Col. 3, lines 20-22).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2, 8, 9, 11, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U.S Pat. 6,372,185) as applied to the above claims, and further in view of Oda et al. (U.S Pat. 7,001,539 hereinafter, "Oda").

Hashimoto is relied upon as set forth above. With respect to instant claim 2, 8, 9, 15, and 16, Hashimoto does not teach kneading until the mixture reaches the wetting point and a step of adding a dispersing agent to the mixture obtained by the kneading step, thereby slurry the mixture.

In the same field of endeavor, Oda teaches adding a solvent to wet the metal particles (Col. 3, line 61). Oda further teaches adding a surface active agent (i.e. dispersing agent) such as cation, non-ionic, and anionic surface active agent together with solvent to enhance the wetting effect of the solvent on the metal particles (Col. 3, lines 27-32). Oda also teaches adding any surface active agent at a rate of 0.05-10 weight units (weight parts) to 100 weight units of the metal particles into the mixture (Col. 3, lines 32-34). Oda's surface active agent disclosure is considered to read on the instant claimed limitation of a polyethyleneglycol system dispersing agent whose HLB is 5-7.

Hashimoto and Oda references are combined because both teach analogous art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a step of adding a surface active agent and solvent to Hashimoto's method of preparing a conductive paste and kneading until the entire

surface of the metal particles are wet (wetting point), as taught by Hashimoto in view of Oda, in order to prevent agglomeration of between fine metal particles.

Regarding claim 11, Hashimoto teaches agglomeration problems generated in a paste due to insufficient dispersion (Col. 1, line 66 to Col. 2, line 4) and benefits of a well dispersed paste in pattern printing (Col. 1, lines 57-65). Thus, it is within the expected skills of a skilled artisan to use a homogenizer to disperse the metal particles uniformly in the slurry mixture.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U.S Pat. 6,372,185) as applied to the above claims, and further in view of Nishide et al. (U.S Pat. 7,001,539 hereinafter, "Nishide").

Hashimoto is relied upon as set forth above. With respect to instant claims 5 and 6, Hashimoto teaches steps of adding 60-80% weight of conductive powder (Ag) and 5-20% weight Pd resinate (Pd content in the resinate being 5-15%) with an organic vehicle made by dissolving 1-5% weight of ethyl cellulose (binder) in 10-20% weight of organic solvent to form a paste having a solid concentration of 84-94% or more specific 85-92% (Col. 1, lines 33-38 and Col. 4, lines 20-34).

Hashimoto failed to suggest a step of adding 100 parts (about 85% weight or more specific 90% weight) of conductive powder to said binder and said solvent.

In the same field of endeavor, Nishide teaches steps of adding 40-90 wt % of electrically conductive components with 10-55 wt % of organic vehicle component (Col. 6, lines 28-31). Nishide organic vehicle component is considered to include organic solvent and organic binder.

Hashimoto and Nishide references are combined because both teach analogous art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adding 90% weight of conductive powder as taught by Nishide with Hashimoto's organic vehicle made by dissolving 1-5% weight of ethyl cellulose (binder) in 10-20% weight of organic solvent to form a paste having a solid concentration of 84-94% or more specific 85-92% because such as method containing conductive powder, binder and solvent in the claimed ranges is expressly suggested by the prior arts and therefore is an obvious method.

Response to Arguments

10. Applicant's arguments with respect to claims 1-9 and 11-16 have been considered but are moot in view of the new ground(s) of rejection set forth above.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh T. Nguyen whose telephone number is (571) 272-8082. The examiner can normally be reached on Monday-Friday 8:00-5:00 EST PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KNT 11/15/2007

Mark Kopec
Primary Examiner